Appendix E

Environmental Awareness

Commanders, unit leaders, and soldiers have specific duties and responsibilities concerning protection of the environment. Soldiers are expected to do what is right in the absence of specific guidance. Unit leaders and commanders must be competent and confident in the area of environmental stewardship. Not all leaders are required to be environmental experts; however, they must be aware and responsive to compliance and prevention issues required during the execution of their duties. The information contained herein is considered an overview of expected duties and responsibilities in order to build a foundation of basic environmental awareness. Throughout is reference to material for further reading; research of these documents provides a complete explanation of legal and ethical responsibilities.

SECTION I - ARMY ENVIRONMENTAL AWARENESS

GENERAL POLICY STATEMENTS

E-1. The Army's environmental vision states: "The Army will be a national leader in environmental and natural resource stewardship for present and future generations as an integral part of our mission". To achieve this vision, the Army's environmental strategy places a high priority on sustained compliance with all environmental laws; takes into account the restoration of previously contaminated sites; focuses on pollution prevention; and accounts for the conservation and preservation of natural resources.

E-2. The Army environmental ethic calls for the chain of command to establish and support a stewardship climate which supports *compliance*, obeying the law; *prevention*, the concept of reduce, reuse, recycle; *conservation*, control and protection of natural resources; and *restoration*, the cleanup of contaminated areas. This ethic supports caring for the environment while conducting realistic training.

E-3. Army personnel should become familiar with these policy statements; they are established so that our natural environment will be available for present and future generations. Complete information regarding these polices can be obtained in Section II of *The Field Artillery Guide to Environmental Considerations.*

SECTION II - PALADIN SPECIFIC ENVIRONMENTAL CONSIDERATIONS

FIELD ACTIVITIES

E-4. The M109A6 Howitzer (Paladin) is a powerful, highly mobile, and very lethal weapon system capable of providing devastating fire support from multiple locations. Because of this power and mobility, the Paladin provides tremendous tactical advantage. These same attributes that contribute to their lethality and tactical value make them a threat to our environment unless they are employed prudently and in consideration of environmental preservation. This section will identify and address the various preventive measures that can be utilized in order to decrease possible environmental damage while conducting realistic training from the Paladin, associated vehicles, and support personnel involved in training and operations.

E-5. Key field environmental considerations include, but are not limited to, the following:

- Wheeled and tracked combat vehicles should stay on established roads, trails, firing points, and firebreaks, unless conducting specific cross-country maneuver exercises. Additionally, confine pivot turns and neutral steers to the middle of the roadway.
- Follow land contours rather than driving up and down hills or along creeks.
- In order to minimize siltation of streams; use bridges or low water crossings when crossing permanent streams. If crossing through a stream becomes necessary, then do so by the most direct route (90-degree angle).
- Establish refueling and maintenance areas away from wetlands, drainage areas, and near or over water sources.
- Federal law prohibits the removal of artifacts from federal property. Do not excavate, remove, damage, or otherwise alter or deface any archaeological resource located on a military reservation.
- Avoid and mark off-limit areas for known archaeological sites during military training exercises. Penalties can be up to $250,000 for knowingly disturbing a site.
- Be aware of and avoid nesting, bedding, and habitats of all species of birds and animals. Mark as off-limits, designated threatened or endangered species areas.
- Use camouflage netting instead of live vegetation.
- When planning training activities, conform to installation and community noise-abatement regulations. Identify and mark the off-limit boundaries.
- Open fires, such as burning of garbage, refuse, and rubbish is not allowed on range areas. For burning excess powder increments, use only designated powder burn sites.
- Conform to field sanitation and medical standards when using soakage pits for wash water, liquid kitchen wastes, and grease traps per FM 21-10, *Field Hygiene and Sanitation.*
- Establish field satellite-accumulation site and procedures.

- Police field locations and establish field trash-collection point and procedures. Remove materials packed into training area on departure from the training area.
- When the training exercise is complete, repair any field damage such as ruts from vehicles, foxholes, and other emplacements.
- Conduct all training with a concern for conservation and future use of range training areas.

MUNITIONS

E-6. Munitions and ordnance are not considered wastes as long as they are in their life cycle of use and may still be used for their intended purpose. Resource Conservation Recovery Act (RCRA) hazardous waste management requirements do not apply to:

- Explosive ordnance disposal (EOD) sites that are used solely for training, emergency, and range clearance operations.
- Open burning/open detonation training activities on training ranges, impact ranges, firing ranges, or the equivalent.
- Burning excess propellant bags/increments incidental to the training mission. All excess powder will be burned at designated powder burn areas.
- Installation range clearance operations of conventional ordnance.

HAZARDOUS MATERIAL AND HAZARDOUS WASTE

E-7. The RCRA of 1976 is the framework for managing hazardous waste and has established standards for identifying, classifying, and storing of these wastes. RCRA regulations require those involved in managing hazardous substances to be properly trained, and the training to be properly documented.

E-8. Key hazardous material and hazardous waste environmental considerations include, but are not limited to, the following items:

- Personnel dealing with hazardous materials should be trained in proper handling, containment, cleanup, and reporting procedures.
- A material safety data sheet (MSDS) must be on file, and made available to all personnel regarding hazardous material.
- Bore cleaner waste. Is a chlorinated hydrocarbon product used? If so, how is the waste disposed?
- Battery electrolyte (acid) from damaged batteries should be drained and disposed of through turn-in via installation policy and maintenance SOP. Refer to TB 43-0134, *Battery Disposition and Disposal*, for complete procedures regarding battery handling and disposal.
- Never allow the accumulation of more than 55 gallons of a hazardous waste, or 1 quart of acutely hazardous waste, at the satellite accumulation point. Process all hazardous waste in a timely manner.
- Hazardous waste containers should be kept closed when not in use, kept free of rust and leaks, and stored separately from incompatible wastes.
- Incompatible wastes must never be transported on the same vehicle.

- Ensure that all Department of Transportation (DOT) and hazardous waste transportation requirements are met prior to transporting hazardous material or hazardous waste on public highways.
- Check with the local environmental office for transportation procedures within the installation boundary.
- For complete information regarding storing and handling of hazardous materials refer to TM 38-410, *Storage and Handling of Hazardous Materials.*

MATERIAL SAFETY DATA SHEET

E-9. A MSDS is a summary of information on a given chemical identifying material, health and physical hazards, exposure limits, and precautions. A MSDS describes the hazards of a material and provides information on how the material can be safely handled, used, and stored. Insist on receiving a copy of a MSDS when receiving a hazardous chemical from supply, and retain it for when or if you turn in the material. As time permits, periodically review each MSDS pertaining to your unit. This will assure a quick response when identifying symptoms and handling emergencies.

E-10. Unfortunately, there is no specified format for a MSDS, and it doesn't contain all known data of a chemical, but there are typical components. These are outlined in 29 Code of Federal Regulations (CFR) 1910.1200. Use the following information (Figure E-1) as a guide toward what to expect on most MSDS forms.

Section/Topic	Contents
Section 1 - General Information	Manufacturers' name and address Trade or common name of product
Section 2 - Hazardous Components	NIOSH and/or chemical abstract system number Chemical name and percentage
Section 3 - Physical Properties	Boiling point, freezing point, water solubility, etc. Appearance and odor under normal conditions
Section 4 - Fire & Explosion Hazard	Fire-fighting equipment Any unusual fire and explosion hazards
Section 5 - Health Hazard	Routes of entry into the body Emergency and first aid procedures
Section 6 - Reactivity Data	Conditions to avoid Incompatibility with other materials
Section 8 - Control Measures	Recommended respiratory and ventilation Personal protective equipment, if needed
Section 9 - Special Precautions	Handling and storing precautions
Section 10 - Transportation	Applicable regulations Hazards class and required labeling

Figure E-1. Material Safety Data Sheet

MAINTENANCE

E-11. The maintenance officer acts as the hazardous material/hazardous waste (HM/HW) spill coordinator. He/she ensures the accountability, proper storage, and disposal of all HM/HW, and ensures that HM/HW spills are immediately contained and reported. Additionally, the maintenance officer reports nonfunctional/inoperative treatment/collection facilities (such as oil/grease interceptors, floor drains, or catch basins) to the installation environmental office through the unit environmental compliance officer (ECO).

E-12. Key maintenance environmental considerations include, but are not limited to, the following:

- Motor maintenance areas require SOPs and close monitoring; this operation is a continuous source of minor pollution to storm drainage systems due to the constant threat of a spill of fuel or oil. SOPs for prevention or cleanup of spills should be posted in motor maintenance areas, and should be understood by all personnel involved in maintenance activities.
- Refueling operation SOPs should address practices to minimize spills.
- Implement preventive maintenance on all heavy equipment to ensure petroleum products will not be released from the belly pan.
- Ensure pollutants are not discharged into storm or washrack drains or poured on the ground or along fence lines. Some common pollutants are oil, solvents, soap, diesel, gasoline, battery acid, chemicals, waste antifreeze, paint, and grease.
- Asbestos containing parts such as brake shoes, clutch plates, and equipment insulation should be removed, collected, and disposed according to installation policy.
- The least hazardous or preferably, non-hazardous material to perform a function should be used, unless previous research of options clearly indicates otherwise. The Defense Logistics Agency produces a manual, *Environmental Products*, to assist in this process.
- Do not mix fuel, oil, or antifreeze together. This is considered a mixed waste.

SUPPLY

E-13. The supply sergeant is required to have a complete inventory of HM/HW generated by the unit. He/she must also know what chemicals the unit requires, where and how they are stored, how much hazardous waste is generated, and necessary spill response procedures. The supply sergeant should coordinate with the unit S3 or ECO to ensure this information is incorporated into the unit SOP.

E-14. Key supply environmental considerations include, but are not limited to, the following items:

- Requisition only supplies needed and authorized, avoid excessive stockpiling of materials.
- Maintain an accurate inventory in unit SOP of hazardous waste used by the generating unit. This listing should include waste by volume, type, generating process, and location.

- Use of used oil tanks for disposal of solvents, antifreeze, or other HM/HW is against regulation. Storage of hazardous material must be in clearly marked DOT-approved containers.
- Actively support a unit-recycling program.
- Ensure tires and batteries are properly turned in for recycling.
- Ensure used batteries are turned in on a one-for-one basis.

SPILL RESPONSE

E-15. Generally, only persons specifically trained to respond to a spill should handle unit spills. However, all personnel should, at a minimum, report the spill, and be aware of the following four basic steps to spill response:

- Protect yourself. Use personal protective equipment specified in the MSDS.
- Stop the flow. This may be as simple as placing the container upright or closing a valve.
- Contain the spill. Place absorbent material around the spill, and protect drains and ditches.
- Report the spill. Notify supervisor, and other key personnel.

E-16. Each unit is responsible for the cleanup of their own spills, as long as no personnel are put in danger. After the above four steps are completed, take the necessary steps to cleanup the spill. Information on cleanup procedures can be found on the MSDS, unit SOP, or contact installation environmental staff for guidance. Turn in the spilled material and absorbent to the Defense Reutilization Marketing Office (DRMO), or another designated point if a DRMO is not available. Also, ensure there are adequate spill supplies on-hand for future use.

E-17. Key spill prevention, response, and cleanup considerations include, but are not limited to, the following items:

- A spill prevention and response section should be included in the unit SOP outlining installation spill plan requirements.
- Each unit should make available and maintain a spill cleanup kit near any satellite-accumulation area, or where a potential for spill exists. The kit should contain, at a minimum, absorbent material, shovel, brooms, gloves, and appropriate containers. Units who have a potential for release or spill that may impact streams should also maintain brooms for containment.
- Drip pans should be used under vehicles and equipment where spills are likely to occur.
- Spills of oil, fuel, or other hazardous pollutants over 5 gallons in volume, 100 square feet in area, or in any waterway should be reported immediately to the chain of command.
- All topsoil contaminated with oil should be removed, properly disposed, and replaced by the unit. While awaiting disposal, keep the excavated soil covered to prevent runoff in case of rain.

SECTION III - REGULATORY REQUIREMENTS

LAWS AND REGULATIONS

E-18. Military facilities are subject to federal, state, local, and host nation environmental laws; when the requirements differ, the most stringent applies. Ignorance of environmental laws is not an excuse for non-compliance, and it will not protect commanders, soldiers, or the military services from civil and criminal liability. Figure E-2 lists the federal and military laws and regulations that are frequently encountered by Army personnel; however, it is not inclusive of all requirements.

E-19. Additionally, environmental law varies with differing countries, states, and cities. What is legal in one area may be illegal in another. Each installation environmental office knows the laws for that locality, and should be consulted on environmental considerations during the planning and execution of training.

E-20. Army units outside the continental United States (OCONUS) that are not subject to federal environmental regulations decreed by the Environmental Protection Agency (EPA) should comply with the final governing standards of the host nation. In areas where a host nation has minimal or no environmental laws and regulations, comply with the *Overseas Environmental Baseline Guidance Document (OEBGD)* provided by the Department of Defense, AR 200-1, *Environmental Protection and Enhancement*, and AR 200-2, *Environmental Effects of Army Actions*.

Army Regulations

AR 200-1. Environmental Protection and Enhancement
AR 200-2. Environmental Effects of Army Actions
AR 200-3. Natural Resources
AR 200-4. Historic Preservation
AR 420-49. Solid and Hazardous Waste Management
AR 420-76. Pest Management

Executive Orders

EO 11989. Use of off-road vehicles on public land
EO 11990. Wetland protection
EO 12114. Effects of federal actions abroad
EO 12196. OSHA Compliance for federal employees
EO 12580. CERCLA duties and powers
EO 13101. Pollution prevention and recycling

Federal Laws

Archaeological Protection Act of 1979

Clean Air Act of 1970
Clean Water Act of 1972
CERCLA of 1980
EPCRA of 1986
Endangered Species Act of 1973
Federal Facilities Compliance Act of 1992
Hazardous Materials Transportation Act of 1975
National Environmental Policy Act of 1969
National Historic Preservation Act of 1966
Noise Control Act of 1972
Oil Pollution Act of 1990
RCRA of 1976
Toxic Substances Control Act of 1976

Figure E-2. Environmental Laws and Regulations

REGULATORY TRAINING REQUIREMENTS

E-21. Regulatory agencies exist which require environmental training. This training may be at the awareness level for all personnel or at a more specialized level designed for specific personnel. The installation environmental and safety offices can best assist in determining your training requirements and who to contact for additional information. Table E-1 is

provided as a reference of possible training requirements for Paladin operations.

Table E-1. Regulatory Training Requirements

NOTE: The depth or level of training will vary between target audiences. For example, K and E will need in-depth training, while A will only require broad overviews. The letters K, E, N, or A denotes target audience, and are listed below.

Knowledge	Personnel who administer, implement, or comply with contents of regulations such as program manager and technicians in the environmental field. Also includes organizations that need in-depth knowledge of the environmental laws/regulations/programs, such as staff judge advocate.
Executors	All personnel who supervise or actually handle responsibilities dealing with environmental programs, to include ECOs, technicians, and workers. Also includes unit personnel required to execute responsibilities with environmental ramifications as part of their mission.
Need to Know	Personnel who may encounter environmental issues as part of their mission. This may include personnel within the following activities: engineers; designers; emergency personnel; safety; reserve components; first-line supervisors; crew chiefs; NCOs; and various unit personnel as identified by the installation environmental office and their supervisors
Awareness	Public affairs office, reserve components, other unit personnel.

Table E-1. Regulatory Training Requirements (Continued)

Training Topic	Regulatory Reference	K	E	N	A
Hazardous Materials/Waste Compliance Training	29 CFR 1200; 40 CFR 262.34, 264.16, 265.16; 49 CFR 172	*	*	*	*
Hazardous Waste Operations for Installation Restoration	29 CFR 1910.120	*	*		
Hazardous Waste Operations for Treatment Storage and Disposal Facilities	29 CFR 1910.120	*	*		
Emergency Response to Hazardous Materials Incidents/Hazardous Material Technician	29 CFR 1910.120	*	*	*	
National Environmental Policy Act (NEPA)	NEPA of 1969	*			*
National Historic Preservation Act (NHPA)	36 CFR part 800, 36 CFR part 63, NHPA of 1966	*			*
Archaeological Resources Protection Act (ARPA)	43 CFR 7.7 (4) ARPA of 1979	*			
Native American Graves Protection and Repatriation Act (NAGPRA)	NAGPRA of 1990	*			
Emergency Planning and Community Right-to-Know (EPCRA)	EPCRA/SARA 1986 Title 3, Executive Order 12856	*	*	*	*
Lead Based Paint	Lead Based Paint Exposure Reduction Act of 1992, 24 CFR 35	*	*	*	*
Asbestos	40 CFR part 763, 40 CFR 61 part M	*	*	*	*
Endangered Species Act (ESA)	ESA 1973 as amended, 50 CFR par 402	*			*
Clean Water Act (CWA)	CWA S 311	*	*		*
Storm Water Pollution Prevention Planning	CWA S 319	*	*	*	
CFC/Halon Refrigerants	EO 11051, 40 CFR 82.40, 40 CFR 282, 58 FR 92 (p. 28660)		*	*	*
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)	FIFRA of 1972, 40 CFR 265.16, SARA of 1986		*		
Solid Waste Management	40 CFR 240-257/RCRA Subtitle D	*			*
Underground Storage Tanks	40 CFR part 280, RCRA Subtitle I	*			
National Pollutant Discharge Elimination System (NPDES)	CWA of 1990, 40 CFR 122-129	*	*		*
Confined Space Entry	29 CFR 1910.146	*	*	*	*
Occupational Respiratory Protection	29 CFR 1926.58, 29 CFR 1910.134	*	*		
Occupational Exposures to Bloodborne Pathogens	29 CFR 1910.1030	*	*	*	*
Storm Water Compliance	40 CFR 122-129, WPCA S 319	*	*		
Hazard Communication Standard	29 CFR 1910.1200	*	*	*	*
Department of Transportation	49 CFR172.704	*	*	*	*

ENVIRONMENTAL COMPLIANCE OFFICER RESPONSIBILITIES

E-22. It is the unit commander's duty to appoint an ECO and a hazardous waste coordinator; the same person can serve in both positions, per AR 200-1. These appointments are made to ensure that environmental compliance occurs at the unit level. Appointed personnel:

- Should receive formal training and act as an advisor on environmental regulatory compliance during training, operations, and logistics functions.
- Will be the commander's eyes and ears for environmental matters, as the safety officer/NCO is for safety matters.

- Should function as the liaison between the unit and higher headquarters regarding environmental matters such as training requirements, equipment, or supplies that unit personnel need.
- Should inspect HM/HW accumulation sites, and ensures that soldiers handling these materials are properly trained.
- Ensure the unit's SOP covers environmental considerations, conservation, natural resources, pollution prevention, HM/HW, and spill procedures.
- Support the Army's pollution prevention/recycling program.
- Report hazardous material and waste spills immediately.
- Conduct environmental self-assessments or internal environmental compliance assessments, and meet with key installation environmental points of contact, as necessary, to remain updated on any regulatory changes.

SECTION IV - ENVIRONMENTAL RISK MANAGEMENT

ENVIRONMENTAL RISK MANAGEMENT

E-23. Leaders at all levels are required to make timely and appropriate decisions regarding the environment. The failure to do so may negatively impact the training environment, which could then lead to personal liability of individuals directly involved, the chain of command, and the US Army. Therefore, leaders must have a method of managing, assessing, and reducing environmental risks.

THE FIVE-STEP PROCESS

E-24. Risk management is a five-step process designed to provide leaders a methodology for the identification, assessment, control, and evaluation of environmental risks. The following is a summary of these steps from FM 20-400, *Military Environmental Protection*, and FM 100-14, *Risk Management*. (Refer to these FMs for detailed information.)

E-25. Step 1. Identify Hazards - Environmental hazards include all activities that may pollute, create negative noise-related effects, degrade archeological/cultural resources, or negatively effect threatened or endangered species habitats. A select listing of common environmental hazards is located in Figure E-3.

Media Area	Common Environmental Hazards
Air	Equipment exhaust, convoy dust, range fires, open-air burning, pyrotechnics/smoke pots/smoke grenades, part-washer emissions, paint emissions, air-conditioner/refrigeration CFCs, HM/HW release, pesticides, other toxic industrial chemicals or material.
Archeological and cultural	Maneuvering and digging in sensitive areas, disturbing or removing artifacts, demolition/munitions effects, HM/HW spills.
Noise	Low-flying aircraft (helicopters), demolition/munitions effects, nighttime operations, operations near post/camp boundaries and civilian populations, vehicle convoys/maneuvers, large-scale exercises.
Threatened and/or endangered species	Maneuvering in sensitive areas, demolition/munitions effects, especially during breeding seasons, disturbing habitat or individual species, HM/HW spills or releases, poor field sanitation, improper cutting of vegetation, damage to coral reefs,
Soil (terrain)	Over use of maneuver areas, demolition/munitions effects, range fires, poor field sanitation, poor maneuver-damage control, erosion, troop construction effect, refueling operations, HM/HW spills, maneuver in ecologically sensitive areas such as wetlands and tundra, industrial waste runoff, pesticide accumulation in soil, vegetation, and terrestrial organisms.
Water	Refueling operations near water sources, HM/HW spills, erosion and unchecked drainage, amphibious/water-crossing operations, troop construction effects, poor field sanitation, washing vehicles at unapproved sites.

Figure E-3. Common Environmental Hazards

E-26. Step 2. Assess Environmental Hazards to Determine Risk - A risk assessment is a tool used for evaluating the most pressing or most hazardous potential environmental damage. It considers two factors; probability, how often a hazard is likely to occur; and severity, the effect in degrees a hazard will have on personnel, equipment, environment, and mission. Unit leaders should conduct risk assessments before conducting any training, operations, or logistical activities that are not previously addressed in the SOP, or when conditions differ significantly from the SOP. Complete information on risk assessments can be obtained from FM 20-400 for procedures on how to perform an environmental risk assessment.

E-27. Step 3. Develop Controls and Make a Decision - This step is designed to reduce the probability or severity of each hazard, which in turn lowers the overall risk. Control types fall in the categories of educational, physical, or avoidance. Figure E-4 outlines examples of environmental controls, and Section II contains the specifics pertinent to the Paladin.

Control Type	Environmental-Related Examples
Educational	• Conducting unit environmental-awareness training • Conducting an environmental briefing before deployment • Performing tasks to environmental standards • Reviewing environmental considerations in AARs • Reading unit's environmental SOPs and policies
Physical	• Providing spill-prevention equipment • Establishing field satellite-accumulation site and procedures • Policing field locations • Practicing good field sanitation • Posting signs and warnings for off-limit areas
Avoidance	• Maneuvering around historical/cultural sites • Establishing refueling and maintenance areas away from wetlands and drainage areas • Crossing streams at approved sites • Preventing pollution • Limiting noise in endangered and threatened species habitats

Figure E-4. Environmental-related Controls

E-28. Step 4. Implement Controls - Leaders must inform subordinates of risk-control measures, state how each control is to be implemented, and assign responsibilities. They must also ensure these controls are in place prior to the operation. This is accomplished by using the *before*, *during*, and *after* checklists and the environmental risk-assessment process. Examples of checklists can be obtained from Training Circular (TC) 5-400, *Unit Leaders' Handbook for Environmental Stewardship*, or from the field artillery environmental handbook referenced in Section I, in order to determine the environmental considerations that may affect Paladin training and operations.

E-29. Step 5. Supervise and Evaluate - Leaders should monitor controls to ensure effectiveness and whether controls require modification. They should ensure the after action review (AAR) process includes an evaluation of environmental-related hazards, controls, soldier performance, and leader supervision.